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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/791,049

03/02/2004

Xiaorong Wang

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EXAMINER

ASINOVSKY, OLGA

ART UNIT

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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/791,049	Applicant(s) WANG ET AL.	
	Examiner OLGA ASINOVSKY	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 and 27-35 is/are pending in the application.
- 4a) Of the above claim(s) 1-9, 18-22, 32 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-17, 23-25, 27-31, 34 and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/12/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

The amendment filed on 07/29/2008 is entered in part. The status of the claims is:

Claims 1-9, 18-22, 32-33 are withdrawn from consideration as a non-elected invention.

Claim 26 is cancelled.

Claims 10-17, 23-25, 27-31 and 34-35 are under examination.

Claim Rejections - 35 USC § 112

2. Claims 10, 13, 17 and 24 are is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A chemical formulation of a polymer nanoparticle composition is indefinite. An outer layer AND an inner layer can be formed from the same alkenylbenzene monomer. Monomer for formulation of an outer layer is "selected from the group consisting of" is cited under Markush group practice. Thus, a single monomer can be selected for creating a polymer chain, the entire claimed nanoparticle. Therefore, how can the claims require a monoblock polymer and a diblock polymer when the claimed polymer particle can be made from one alkenylbenzene monomer.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

4. Claims 10-17, 23-25, 27-31 and 34-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al U.S. Patent 6,956,084.

The applied reference has a common inventor name with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

5. Wang Patent 6,956,084 (herein Wang' 084) discloses a nano-particle composition having average nanoparticles size of less than about 100 nm, column 2, line 2, for the **present claims 10 and 24**. The nanoparticle composition includes a poly(alkenylbenzene) core and poly(conjugated diene) surface=outer layer, column 1, lines 66-67 and column 2, line 19. The nanoparticles have a polydispersity index of about 1.3, for the **present claim 10**. A surface layer may include a copolymer of at least alkenylbenzene monomer unit and a conjugated diene monomer unit, column 2, lines 45-47. Wang discloses several alternative methods for producing nano-particle compositions having structural modifications. A surface layer of butadiene monomer units is outer layer, column 5, line 36, for the **present claim 10(a)**. The core is inner layer produced from polymerization of alkenylbenzene monomer, column 5, line 31, for the **present claim 10(b)**. The nanoparticles include **diblock and monoblock** polymer chains in the micelles, column 6, lines 55-56 for **the present claims 10, 13, 17 and 24**. The diblock is formed from polymerization of conjugated diene and vinyl-substituted aromatic hydrocarbon, column 7, lines 14-17. One type of method includes forming a first polymer of conjugated diene

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monomers in the hydrocarbon solvent. After formation of the first polymer, a second monomer is added to the polymerization, along with additional initiator. The second monomer polymerizes onto the first polymer to **form a diblock polymer as well as forming a separate second polymer which is a mono-block polymer**, column 6, lines 55-65. The polymerization of a second monomer with additional initiator for producing a separate second polymer which is a mono-block polymer is readable in **the present claims**. Thus, **Wang discloses a mono-block produced from polymerization of an alkenylbenzene monomer**. The first monomer is a conjugated diene monomer, for the **present claims 28-29**. The second monomer is an alkenylbenzene=styrene monomer, **for the present claims 30-31**. The conjugated diene monomers, column 5, lines 36-41 and column 8, lines 5-7, are readable in the **present claims 14-15**. The styrene block may be crosslinked, column 3, line 60, for **the present claim 34**. Vinyl substituted aromatic hydrocarbon monomers, column 5, lines 43-51 are readable in the **present claim 13**. The micelle formed by the polymerization of vinyl-substituted aromatic hydrocarbons and conjugated diene monomers is preferably crosslinked, column 5, lines 60-63, **for the present claim 17**. The polydiene blocks can be hydrogenated to form a modified surface layer, column 7, lines 44-45, for **the present claim 16**. The ratio of mono-blocks to diblocks is in the range from 1 to 99, column 7, lines 35-39, for **the present claim 35**. The present claims are anticipated by the disclosure in Wand '084.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

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application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 10-17, 23-25, 27-31 and 34-35 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 6,875,818. Although the conflicting claims are not identical, they are not patentably distinct from each other because the reference discloses a nano-string composition comprising an outer layer=surface layer and a core=inner layer. A core is formed from a polyalkenylbenzene. A surface layer is formed from a polyconjugated diene or polyalkylene, or mixture thereof. The nano-string has a diameter of less than about 100 nm and a length of between greater than about 1 and 1000 microns, claim 1 of Patent '818. A core is a mono-block polymer, claim 7 of Patent '818. The mono-block polymer chains and diblock copolymer chains are cross-linked, claim 8 of Patent '818. The chemical formulation of a core and a surface layer is readable in the present claims. The term a nano-string particle is equivalent to a nanoparticle, because a nano-string particle having 1 micron of a length is the same as size of 1000 nm nanoparticle in the present claims. Claims of Patent 6,875,818 do not disclose a polydispersity index. However, it would have been obvious to one of ordinary skill in the art to use a non-string composition in claims of Patent 6,875,818 wherein the polydispersity index would be expected because claims of the

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patent discloses the same range of an average length of particles of the analogous chemical composition.

8. Claims 10-17, 23-25, 27-31 and 34-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang U.S. Patent 6,875,818.

The applied reference has a common inventor name with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. All discussions in the paragraph 7 above are adequately set here. In addition, the conjugated diene monomer such as 1,3-butadiene, column 5, line 51, is readable in the present claims. A diblock copolymer is formed of vinyl aromatic hydrocarbon monomers and conjugated diene monomers, column 3, lines 63-65. The crosslinking agent crosslinks the center core of the micelle, column 4, lines 64-66. The ratio of diblock to mono-block polymer chains can be manipulated by altering the amount of initiator added during each step of the polymerization process, column 6, lines 23-25. The ratio of mono-blocks to diblocks in the range of from 1 to 99, column 6, line 36 is readable in the present claims. The polydispersity index would be expected because reference discloses the analogous chemical formulation of nano-string composition having broad range of an average length of particles and wherein the term nano-string is equivalent to nanoparticles. The claimed invention is anticipated by the disclosure in Patent '818.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 10-17, 23-25, 27-31 and 34-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Krom et al U.S. Patent 6,437,050.

Krom discloses a polymer nano-particle composition having less than about 100 nm, column 1, line 44. The polymer nano-particle composition has a poly(alkenylbenzene) core and a surface layer including poly(conjugated diene), column 2, lines 3-67. The nano-particle polymer is in the form of a core/shell structure, claim 1 at column 9. A core of polyalkenylbenzene is readable for being an inner layer in the present claim 10(a). A surface layer derived from polymerizing conjugated diene is readable for being an outer layer in the present claim 10(b). A polymeric composition can be crosslinked, claim 4 at column 9, by a crosslinking agent such as divinylbenzene. The nano-article polymer can be in the form of a diblock copolymer produced by living anionic polymerization process, column 2, lines 51-65. Krom discloses that the nano-particles are formed from the micles with a core including, for example, styrene monomer units, column 3, lines 31-32. The styrene monomer units is homo-styrene monomer units that is a single styrene block= homo-styrene block. The term monoblock is equivalent to a homostyrene polymer unit. Therefore, said additional monomer is polymerized for producing a homopolymer, wherein said homopolymer is readable as applicants' named a mono-block polymer. Also, Krom

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discloses that if additional monomer is styrene, thus this step has advantage to create insoluble vinyl-aromatic block, column 3, line 13. The vinyl-aromatic block is mono-block in the present claims. Krom discloses anionic polymerization process with controlling polymerization conditions. Krom discloses a polydispersity index less than about 1.3, column 2, lines 14-15. Krom discloses that the diblock polymer has molecular weight of about 5,000 to 200,000, column 4, lines 10-11. The resulting nano-particles have molecular weight of between about 100,000 to 3,000,000, column 4, lines 32-33. The broad range of molecular weight is the evidence that the nanoparticles polymer chains will not have equal definition of Mw to Mn. A higher polydispersity index is inherent in Krom invention. The definitions of the conjugated diene monomers, column 3, lines 63-67, are readable in the present claims. Krom discloses a cross-linking agent such as DVB, which has a crosslinking effect to the double bond in a block polymer, column 3, line 20-34. The cross-linking effect is within the scope of hydrogenation effect to the vinyl moiety. The first monomer is a conjugated diene monomer, the second monomer is styrene monomer. The ratio of first monomer can be present in the range of 10 to 90 % and 10 to 90% by weight of vinyl-substituted aromatic hydrocarbon, column 4, lines 13-15. The claimed ratio of second monomer units to first monomer units is expected to control the desired physical characteristics of the resulting polymer nanoparticle composition. A chemical formulation of the claimed mono-block polymer and chemical formulation of a diblock polymer in the present claim 10 is open to any monomer(s). The claimed polymer nanoparticle composition is anticipated by the disclosure in Wang' 050.

The Declaration under 37 CFR 1.132 filed on 07/21/2008 has been considered.

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The Declaration is concerning about a process for producing a mono-block polymer chains, paragraph 7. The claimed invention is a composition. There is no claim to identify a product-by-process. The Declaration is not commensurate in scope with the claims. There is no evidence in the Declaration that a core comprising styrene monomer units in Krom invention is not mono-block polymer chain.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. New references filed on 08/12/2008 after final office action have been considered. The closest reference is FR 2099645 which belongs to Patent family to U.S. Patent 3,725,505. Reference discloses an anionic polymerization process for forming homopolymer of vinylpyrene and block copolymers. None of the cited references discloses multilayered structured nanoparticles having claimed outer layer and inner layer.

Response to Arguments

12. Applicant's arguments filed 08/18/2008 have been fully considered but they are not persuasive. Applicant's arguments with respect to claims 10-17, 23-25, 27-31 and 34-35 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLGA ASINOVSKY whose telephone number is (571)272-1066. The examiner can normally be reached on 9:00 to 5:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796

Olga Asinovsky
Examiner
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